Syllabus

Course Description

Course Title	Network thinking and agent-based modeling
Course Code	27508
Course Title Additional	
Scientific-Disciplinary Sector	SECS-P/08
Language	English
Degree Course	Master in Data Analytics for Economics and Management
Other Degree Courses (Loaned)	
Lecturers	
Teaching Assistant	
Semester	Second semester
Course Year/s	1
CP	6
Teaching Hours	36
Lab Hours	-
Individual Study Hours	-
Planned Office Hours	18
Contents Summary	Network thinking and agent-based modeling (ABM) are ways to conceptualize complexity in the phenomena we observe. The main objective is to approach phenomena with a complexity lens and understand how current behaviors and patterns emerge using network models and agent-based models. In this regard, network and agent-based models provide the logic to tackle the complexity of adaptive systems, in the context of business (e.g. innovation and entrepreneurship). The course covers the following topics: Introduction to systems and complexity. Introduction to networks. Introduction to agent-based modeling. Modeling Diffusion dynamics. Application of complexity on timely topics such as sustainability.
Course Topics	

Keywords	
Recommended Prerequisites	
Propaedeutic Courses	
Teaching Format	
Mandatory Attendance	Recommended, but not required.
Specific Educational Objectives and Learning Outcomes	Knowledge and understanding: The student acquires specific knowledge of the economic and business domains of his/her interest and necessary to address decision-making and management issues in public and private organisations with an interdisciplinary perspective. In the Data Analytics for Economics pathway, knowledge will be oriented towards economic theory, economic analysis and econometrics through the development of micro- and macroeconomics, decision theory under conditions of uncertainty, time series analysis and forecasting techniques, methods for causal inference from both administrative and experimental data. Knowledge will also be oriented towards data analysis. In the Business Analytics track, the knowledge acquired will concern the tools necessary for analysing and interpreting business and organisational data, as well as business economic measurements, business models and their evolution, tools and techniques to support decision-making, performance measurement systems consistent with digitisation and sustainability processes, the governance of marketing processes, with particular regard to digital and interactive marketing and the impact of digitisation on marketing activities. Aapplying knowledge and understanding: Ability to analyse business issues that characterise data-driven decision support through the application of statistical and computational models. Ability to use and apply models for market analysis and economic policy formulation. Making judgements: Master's graduates will have the ability to apply the acquired knowledge to interpret data in order to make directional and operational decisions in an economic-business context. Master graduates will have the ability to apply the acquired knowledge to support processes related to production,

	management and risk promotion activities and investment choices through the organisation, analysis and interpretation of complex databases. Communication skills: Master's graduates will be able to communicate effectively in oral and written form the specialised contents of the individual disciplines, using different registers, depending on the recipients and the communicative and didactic purposes, and to evaluate the formative effects of their communication. Learning skills: MSc graduates should be familiar with the tools of scientific research. They will also be able to make autonomous use of information technologies to carry out bibliographic research and investigations both for their own training and for further education. In addition, through the curricular teaching and the activities related to the preparation of the final thesis, they will be able to acquire the ability - to identify thematic links and to establish relationships between methods of analysis and application contexts; - to frame a new problem in a systematic manner and to implement appropriate analysis solutions; - to formulate general statistical-econometric models from the phenomena studied.
Specific Educational Objectives and Learning Outcomes (additional info.)	
Assessment	
Evaluation Criteria	
Required Readings	
Supplementary Readings	
Further Information	
Sustainable Development Goals (SDGs)	